

WHAT IS CLAIMED IS:

[C001] 1. An inspection system for inspecting a three-dimensional volume, comprising;

at least one sensor coupled to a rolling object, wherein the at least one sensor is disposed on a non-contact outer region of the rolling object and at a pre-determined distance from a center of the rolling object; wherein the at least one sensor is configured to generate signals representative of a condition of a region on the three dimensional volume; and

a data analyzer configured to analyze the signals to determine the condition of the three-dimensional volume at specific locations therein.

[C002] 2. The inspection system of claim 1, wherein the at least one sensor is disposed at a periphery of the non-contact outer region of the rolling object.

[C003] 3. The inspection system of claim 1, wherein the at least one sensor comprises a plurality of sensors disposed at a pre-determined distance from the center of the rolling object, and wherein a sensor closest to a point of rolling is active.

[C004] 4. The inspection system of claim 1, wherein the at least one sensor is configured to receive signals indicative of a condition of the three-dimensional volume.

[C005] 5. The inspection system of claim 1, wherein the rolling object is stationary.

[C006] 6. The inspection system of claim 1, wherein the rolling object is in motion.

[C007] 7. The inspection system of claim 5, wherein the data analyzer is at a remote location.

[C008] 8. The inspection system of claim 1, wherein the at least one sensor is an ultrasound sensor.

[C009] 9. The inspection system of claim 1, wherein the rolling object comprises a wheel of a locomotive.

[C010] 10. The inspection system of claim 1, wherein the three-dimensional volume is a railway track.

[C011] 11. A method for inspecting a three-dimensional volume, comprising;

translating a rolling object over a surface of the three-dimensional volume at a high speed, wherein the rolling object comprises at least one sensor coupled thereto, disposed on a non-contact outer region of the rolling object at a pre-determined distance from its center; and

sensing signals reflected from the three-dimensional volume as the rolling object translates over the three-dimensional volume.

[C012] 12. The method of claim 11, wherein the sensing occurs from a periphery of a non-contact region of the rolling object.

[C013] 13. The method of claim 11, further comprising receiving signals indicative of a condition of the three-dimensional volume.

[C014] 14. The method of claim 13, further comprising, analyzing the signals to determine the condition of the three-dimensional volume at specific locations in the three-dimensional volume.

[C015] 15. The method of claim 14, wherein the analyzing occurs in real-time.

[C016] 16. An inspection system for inspecting a railway track, comprising;

at least one sensor coupled to a wheel of a locomotive, wherein the at least one sensor is disposed on a non-contact outer region of the wheel and at a pre-

determined distance from a center of the wheel; wherein the wheel is translating over the railway track at a high speed; wherein the at least one sensor is configured to generate a signal representative of a condition of a region on the railway track; and

a data analyzer configured to analyze the signals to determine the condition of the railway track at specific locations therein.

[C017] 17. The inspection system of claim 16 wherein the at least one sensor is disposed at a periphery of the non-contact outer region of the wheel.

[C018] 18. The inspection system of claim 16, wherein the at least one sensor comprises a plurality of sensors disposed at a pre-determined distance from the center of the wheel object, and wherein a sensor closest to a point of rolling is active.

[C019] 19. The inspection system of claim 16, wherein the at least one sensor is configured to receive signals indicative of a condition of the railway track.

[C020] 20. The inspection system of claim 16, wherein the data analyzer is coupled to the locomotive.

[C021] 21. The inspection system of claim 16, wherein the data analyzer is at a remote location.

[C022] 22. The inspection system of claim 16, wherein the at least one sensor is an ultrasound sensor.